



---

# Battery solutions for medical applications

by Tadiran

---

# ➤ Medical Products - Overview

## The Power Behind Modern Medicine

Tadiran produces industrial grade lithium batteries for medical applications, including lightweight cells for surgical tools, cells that can endure the cold chain during transport, and cells that can withstand high-temperature autoclave sterilization.







## Tadiran produces the following battery solutions:

- [TLM Series](#) – high-energy and high-power lithium metal oxide batteries.
- [TLI Series](#) – industrial grade Li-ion rechargeable batteries that can withstand high temperature autoclave sterilization.
- [TL Series](#) –  $\text{LiSOCl}_2$  batteries for the medical cold chain, where consistent temperatures as low as  $-80^\circ\text{C}$  must be consistently maintained.
- [TLH Series](#) -  $\text{LiSOCl}_2$  batteries that are specially modified to withstand multiple sterilization cycles at up to  $125^\circ\text{C}$ .



# ► Unique characteristics of Tadiran batteries

Tadiran manufactures advanced lithium batteries used throughout the medical field with the focus on the following characteristics:

-  Reliability – patient wellness depends on procedure outcome.
-  High power-to-size ratio – enables the medical device to be smaller and lighter.
-  Long shelf life – ensuring that the device will operate reliably after long storage periods without needing to recharge the battery.
-  High temperature survivability – if sterilization is required.
-  Cold temperature operability – for items transported through the cold chain.
-  Ability to supply high pulses – to run motors and communications circuits.



**Examples of  
Tadiran batteries  
used in medical  
applications**



# ➤ Lithium thionyl chloride $\text{LiSOCl}_2$ for cold chain and autoclave



Tadiran bobbin-type  $\text{LiSOCl}_2$  batteries power data loggers that continuously monitor the transport of pharmaceuticals, vaccines (including COVID-19), tissue samples, and transplant organs at cold chain temperatures down to  $-80^\circ\text{C}$ .



Real-time locating system (RTLS) delivers rapid location and condition updates, capturing interactions between equipment, patients and staff within seconds. Tadiran high temp. batteries enable the device to be “always on” even during autoclave sterilization.

## ➤ **Compact and light batteries for devices with long life and high power**

### **Bone growth stimulator (low continuous current):**

A bone growth stimulator requires low continuous current to emit low-intensity, high frequency sonic pressure waves that stimulate bone growth and healing. Use of a  $\text{LiSOCL}_2$  battery pack makes this wearable device more compact and lightweight for greater user comfort.



### **AED (long shelf life, high pulses):**

An automatic external defibrillator (AED) requires a power supply that offers unparalleled shelf life, as the device can remain idle for extended periods, but then must operate reliably in the event of a cardiac arrest. Hybrid  $\text{Li/SOCL}_2$  batteries are ideal for use in AEDs because they feature very low annual self-discharge rate (less than 1 percent per year), can withstand extreme temperatures, and are able to deliver up to 15A pulses.



### **Hand-held surgical drills (high rate, high pulse):**

Surgical screwdrivers use lithium metal oxide batteries to reduce size and weight without sacrificing power or performance, delivering high continuous power and high pulse amplitude.



# ➤ Applications and most commonly used battery

Application	TLH High-temperature LiSOCl <sub>2</sub>	TL Low-temperature LiSOCl <sub>2</sub>	TLM Lithium Metal Oxide	TLI Rechargeable Li-ion
Automatic external defibrillators				✓
Surgical power tools			✓	✓
Infusion pumps			✓	
Handheld medical devices			✓	✓
Cold chain (-80°C)		✓		
Autoclave sterilization	✓			✓
RFID Tags/Asset Tracking	✓	✓		✓

**Li-ion  
rechargeable cell  
for autoclave  
sterilization:  
TLI-1550HT**





## ➤ TLI-1550HT cell with extended temperatures range

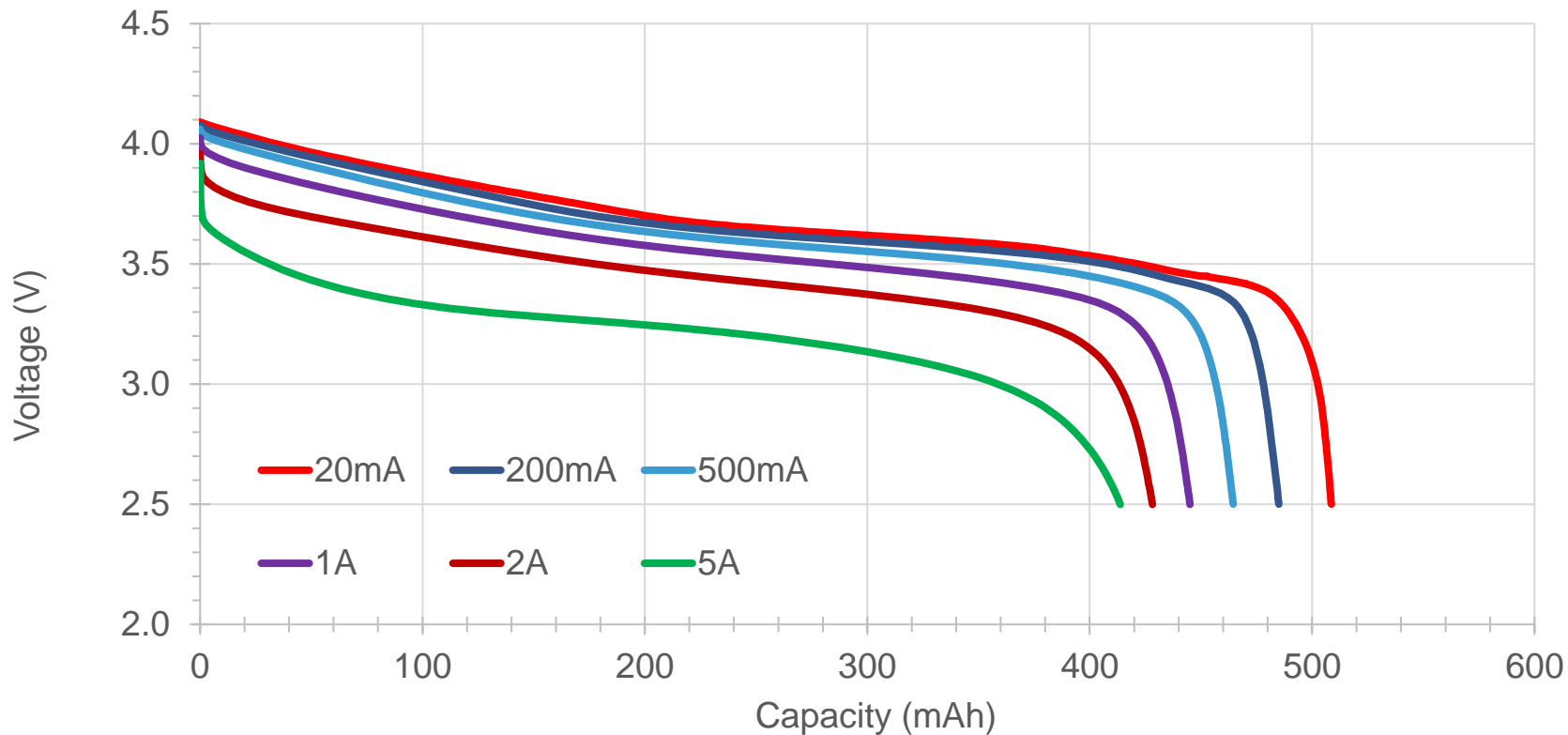
Tadiran Batteries produces **TLI-1550HT rechargeable Lithium-ion (Li-ion)** batteries that are specifically modified for medical applications requiring autoclave sterilization cycles at temperatures up to 135°C. Common applications include surgical saws, drills, reamers, staplers, shavers, wire/pin drivers and hi-power tags.

### Cell Characterization:

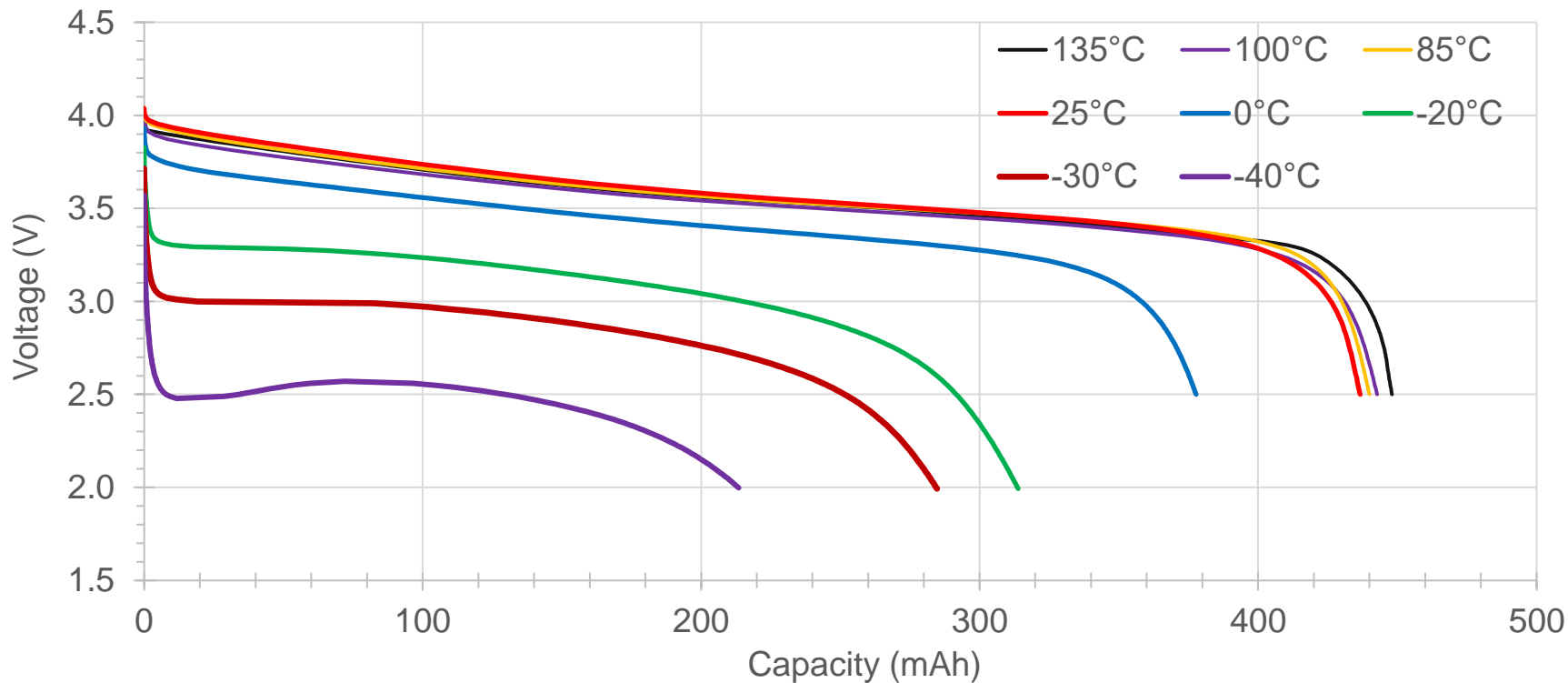
- Operating and storage temperature range: -40 to 135°C.
- 500 mAh capacity for 1550 size (170 Wh/liter).
- High power up to 18W (2000 W/liter).
- Thousands of charge and discharge cycles.
- Extreme safety up to 170°C exposure.
- Suitable for Medical sterilization.



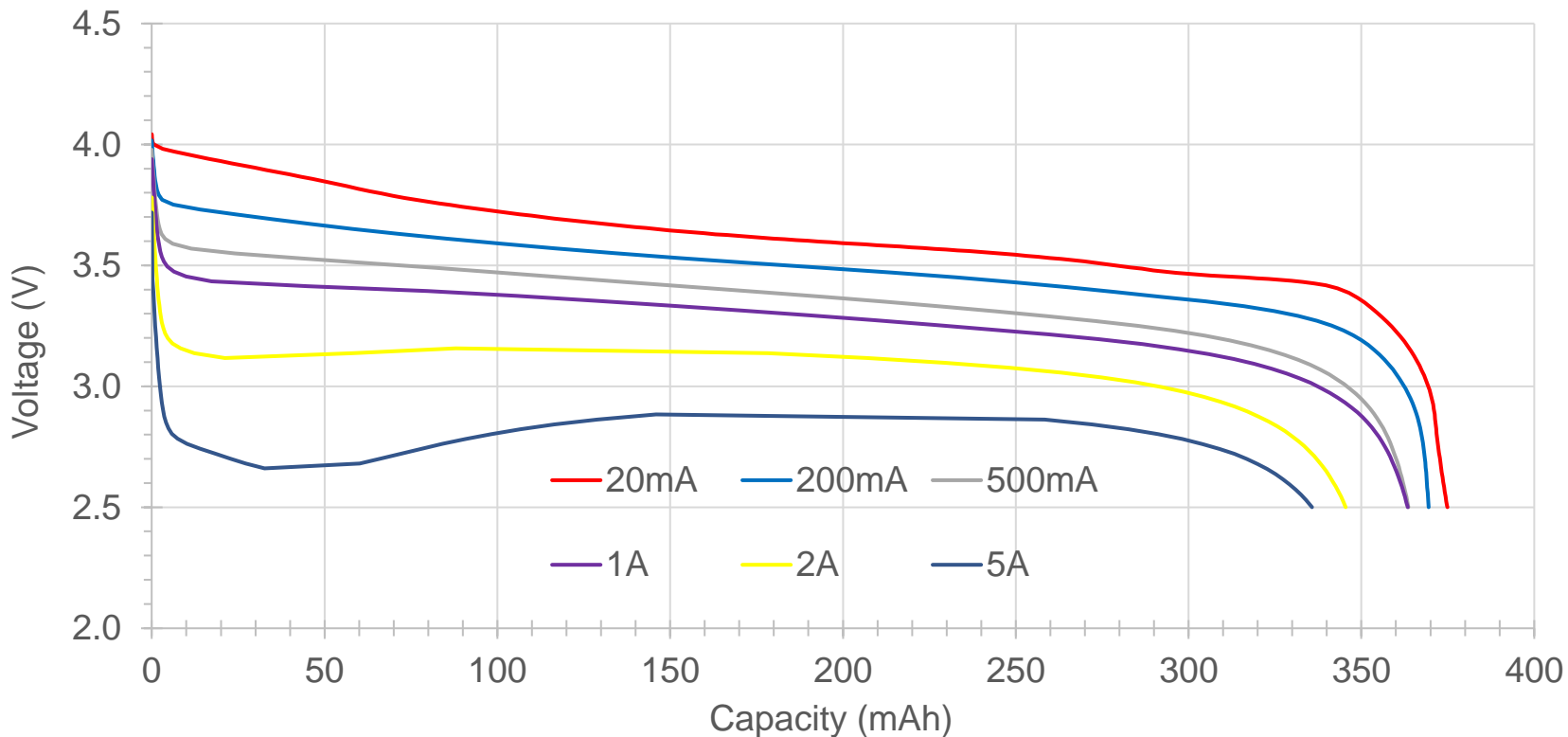
## ▶ TLI-1550HT: Discharge curves at RT



# ▶ TLI-1550HT: Discharge curves at 1A

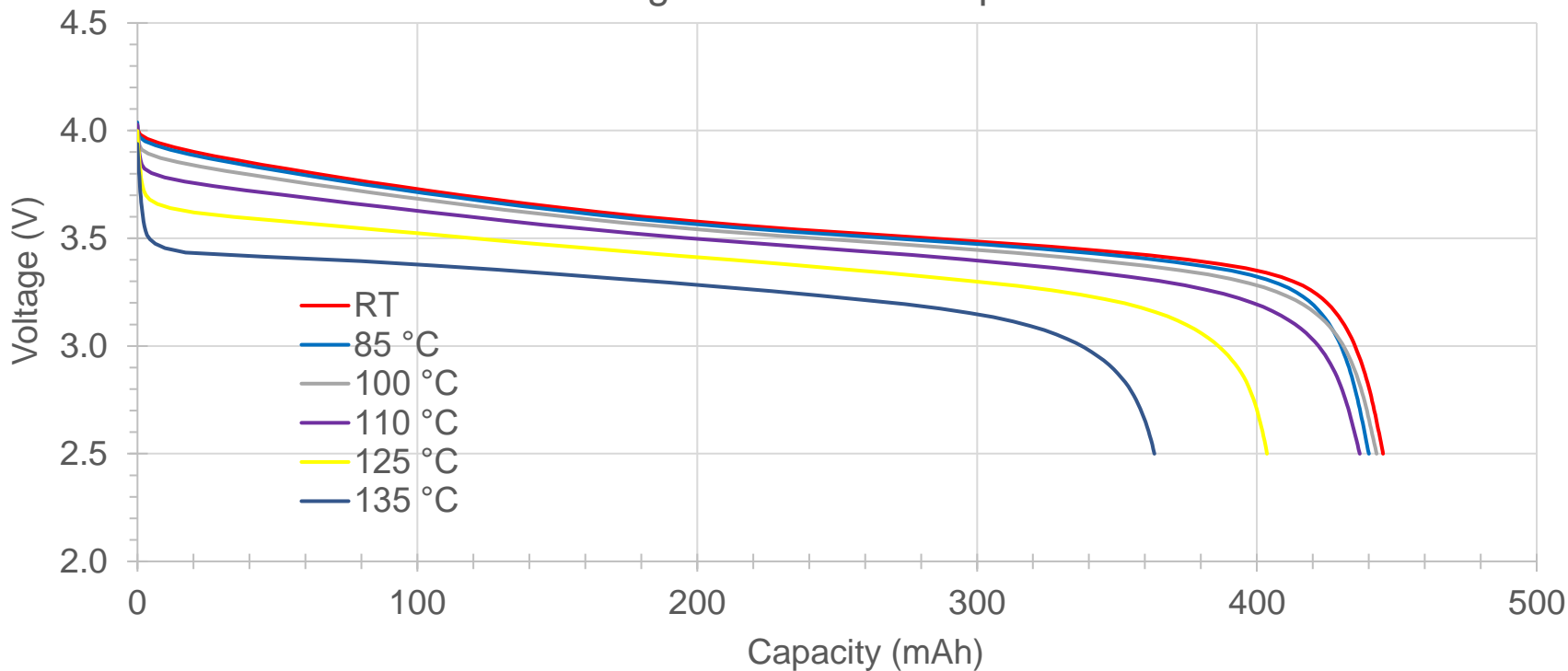


# ▶ TLI-1550HT: Discharge curves at RT after storage 24h at 135°C



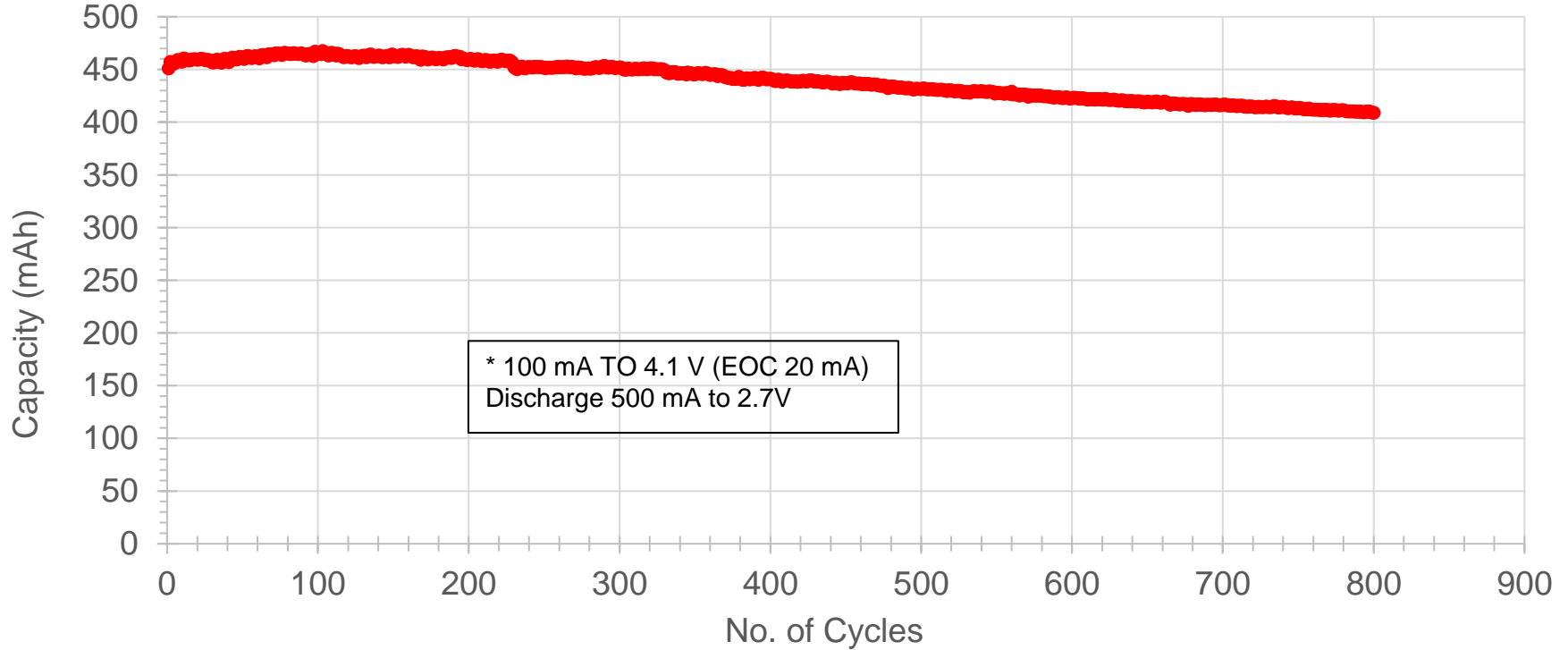
# ▶ TLI-1550HT: High temperature stability

Discharge capacity at 1A  
after 24h storage at different temperatures

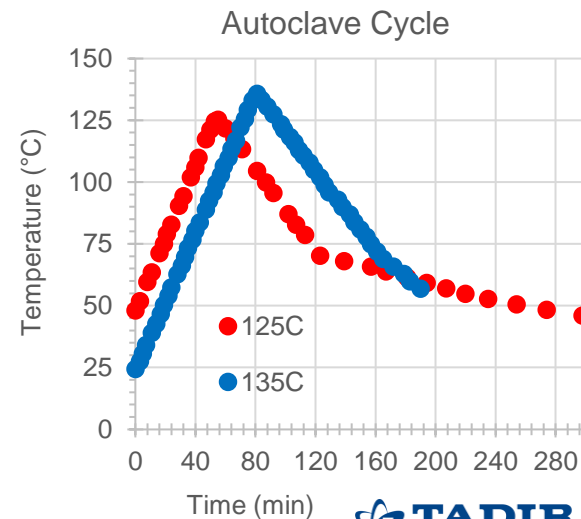
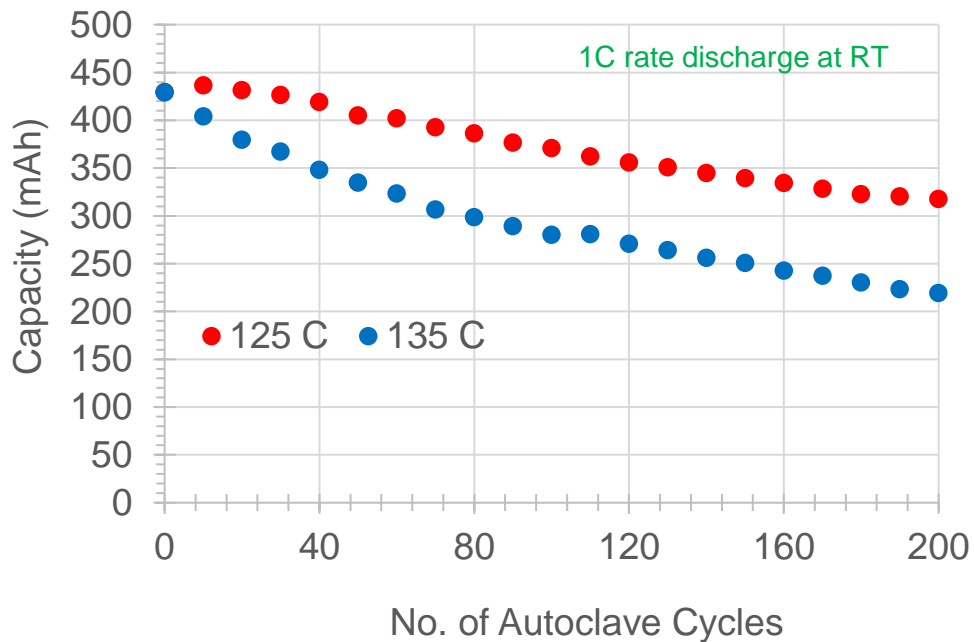


# ▶ TLI-1550HT: long cycle life

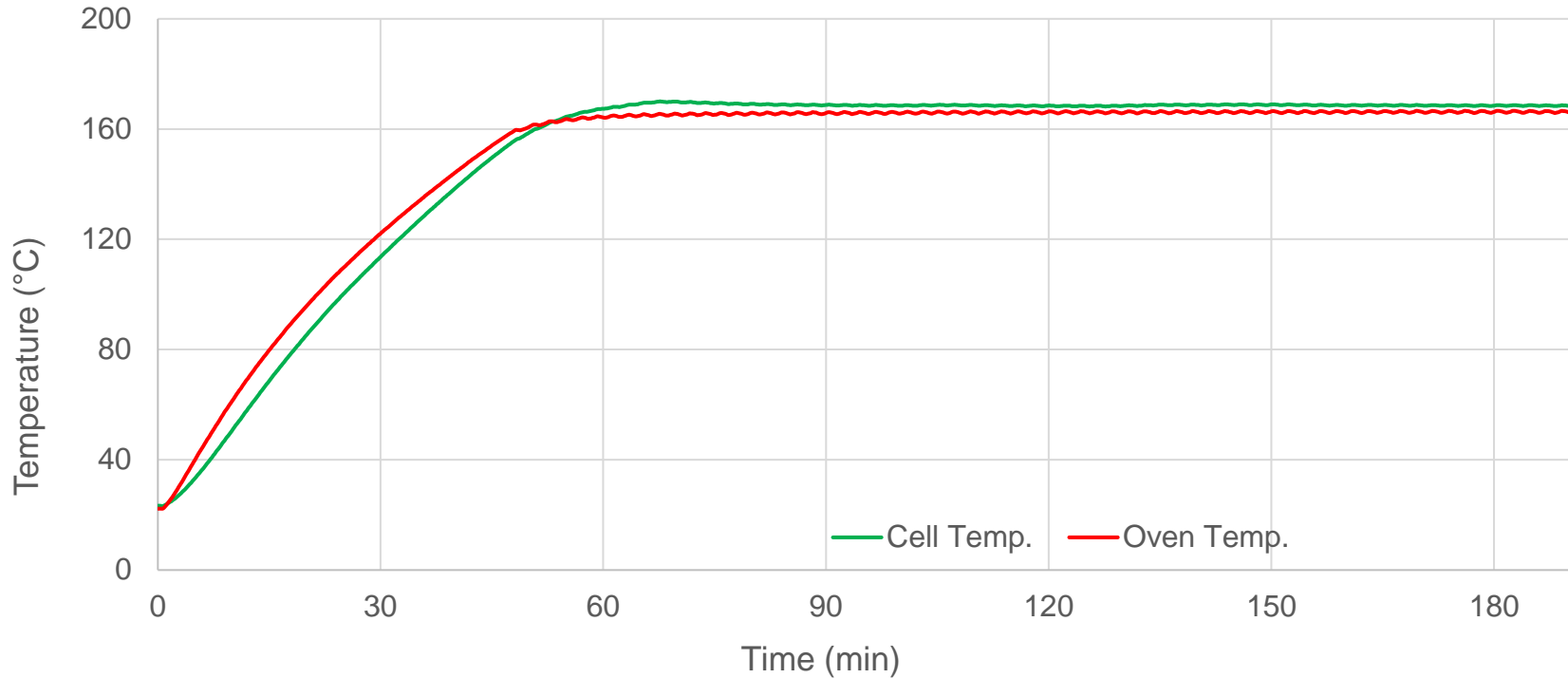
Charge/ Discharge Cycling Performace at RT \*



# ▶ TLI-1550HT: Excellent stability upon Autoclave sterilization cycles



# ▶ TLI-1550HT: Oven test at 170°C - Excellent safety





## ➤ Application Experts at your service

Battery performance is affected by factors such as temperature, storage conditions, load profile, and chemistry. It's important to carefully consider battery behavior over its lifetime to ensure it meets application needs.

We offer a free Application Questionnaire analysis to recommend the best options based on your power requirements. Our experienced engineers can test your application in conditions that are as close as possible to reality or test the battery by stocking it in a warm environment to make it age prematurely before testing the required load profile.

To get the most appropriate solution, please fill out [our questionnaire](#) with as much data as possible. Your data will be kept confidential and used solely to optimize your solution.



# Thanks!

Vitaly Milner

Product Manager

[vitaly-m@tadiran-batt.com](mailto:vitaly-m@tadiran-batt.com)

<http://www.tadiranbat.com>

